

NATURAL RESOURCES CONSERVATION SERVICE

CONSERVATION PRACTICE STANDARD

Residue Management, Mulch Till

(Acre)

Code 329B

DEFINITION

Managing the amount, orientation and distribution of crop and other plant residues on the soil surface year round while growing crops where the entire field surface is tilled prior to planting.

PURPOSES

This practice may be applied as part of a conservation management system to support one or more of the following:

- ◆ Reduce sheet and rill erosion
- ◆ Reduce wind erosion
- ◆ Conserve soil moisture
- ◆ Improve soil health
- ◆ Provide food and escape cover for wildlife
- ◆ Manage snow to decrease blowing and drifting

CONDITIONS WHERE PRACTICE APPLIES

This practice applies to all cropland and other land where crops are grown. This practice includes tillage and planting methods commonly referred to as mulch tillage or chiseling and disking. It applies to tillage for both annual and perennial crops.

CRITERIA

General Criteria Applicable to All Purposes

Loose residues to be retained on the field shall be uniformly distributed on the soil surface. Where combines or similar machines are used for harvesting, they shall be equipped with spreaders capable of distributing residue over the working width of the header.

Residues shall not be burned.

Tillage implements shall be equipped to operate through plant residues without clogging and to maintain residue on or near the soil surface by undercutting or mixing.

Planters, drills, or air seeders shall be equipped to plant in residue on the soil surface or mixed in the tillage layer.

The number, sequence, and timing of tillage and planting operations, and the selection of ground-engaging components shall be managed to achieve the planned amount, distribution, and orientation of residue after planting or at other essential time periods. Acceptable alternative tillage sequences shall be initially determined by a residue budget using locally applicable data on residue production by crops and residue reduction by tillage machines. Further adjustments shall be made as needed during the tillage sequence based on field measurements of remaining residue.

Conservation practice standards are reviewed periodically, and updated if needed. To obtain the current version of this standard, contact the Natural Resources Conservation Service.

Indiana NRCS FOTG – September 1999.

Additional Criteria to Reduce Sheet and Rill Erosion

The amount of residue needed to reduce erosion within the soil loss tolerance (T) or any other planned soil loss objective, shall be determined using current approved erosion prediction technology. Partial removal of residue by means such as baling or grazing shall be limited to retain the amount needed for soil protection. Calculations shall account for the effects of other practices in the conservation management system.

Tillage operations shall be limited to methods that leave residue on the surface and maintain the planned cover conditions.

Additional Criteria to Reduce Wind Erosion

The amount and orientation of residue needed to reduce erosion within the soil loss tolerance (T) or other planned soil loss objective shall be determined using current approved wind erosion prediction technology. Partial removal of residue by means such as baling or grazing shall be limited to retain the amount needed for soil protection. Calculations shall account for the effects of other practices in the conservation management system.

Additional Criteria To Maintain Or Improve Soil Organic Matter Content

The amount of residue and the number and type of tillage operations needed to achieve the desired soil condition, shall be determined using the current approved soil conditioning index procedure. Partial removal of residue by means such as baling or grazing shall be limited to retain the amount needed. Calculations shall account for the effects of other practices in the conservation management system.

Additional Criteria To Conserve Soil Moisture

A minimum quantity of 50 percent residue cover shall be maintained throughout the year. Residue shall be evenly distributed and maintained on the soil surface. Partial removal

of residue by means such as baling or grazing shall be limited to retain the amount needed.

Additional Criteria to Manage Snow to Decrease Blowing and Drifting

Stubble shall be left standing as high as possible by the harvesting operation, but not less than 6 inches in any case.

Stubble shall be maintained in a standing orientation over winter to trap and retain snow. Loose residue may be removed provided that the remaining residue is left standing.

Fall tillage operations shall be limited to undercutting tools such as blades, sweeps, or deep tillage implements such as rippers or subsoilers, in order to maintain stubble in a standing condition the months when snow occurs.

Additional Criteria to Provide Food and Escape Cover for Wildlife

The amount of residue, height of the stubble, and length of the management period necessary for meeting habitat requirements for the target species or wildlife population shall be determined using an approved habitat evaluation procedure. Residues shall not be removed unless it is determined that removal would not adversely affect habitat values.

Stubble shall be maintained standing over winter. Tillage shall be delayed until spring in order to maintain waste grain on the soil surface during winter.

CONSIDERATIONS

1. Excess removal of plant residues by such means as baling or grazing often produces negative impacts on resources. These activities should not be performed without full evaluation of impacts on soil, water, animal, plants, and air.

2. Mulch till may be practiced continuously throughout the crop sequence or may be managed as part of a residue management system, which includes other tillage methods such as no till.
3. Production of adequate amounts of crop residue necessary for the proper functioning of this practice can be enhanced by selection of high residue producing crops and crop varieties in the rotation, use of cover crops, and adjustment of plant populations and row spacings.
4. Where improvement of soil tilth is a concern, use of subsoilers, which have minimal surface disturbance, will enhance accumulation of organic material in the surface layer.
5. The values of residues for wildlife habitat can be enhanced by leaving rows of unharvested crop standing at intervals across the field, along field edges, and in odd areas of fields.

PLANS AND SPECIFICATIONS

Specifications for establishment and operation of this practice shall be prepared for each field or treatment unit according to the Criteria, Considerations, and Operations & Maintenance described in this standard. Specifications shall be recorded using approved specification sheets, job sheets, narrative statements in the conservation plan, or other acceptable documentation.

OPERATION AND MAINTENANCE

Procedures, technical details, and other information listed below provide general guidance for carrying out selected components of this practice.

Estimates of residue cover after selected tillage or planting operations shall be determined according to the guidelines in the National Agronomy Manual, Part 503, Subpart E.

The line transect method shall be the approved method used to evaluate the percentage of ground surface actually covered by plant residues.